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A NEW *BEROSUS* FROM ARIZONA, WITH A KEY TO THE ARIZONA SPECIES (COLEOPTERA, HYDROPHILIDAE)

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During the past several summers, many thousands of beetles have been collected in the southwestern desert areas of the United States, as part of our study of beetle population dynamics.³ The routine identification of this material shows that the following species of beetle is undescribed. The description is presented here in order that the species may become known as part of our fauna and to make it available to future revisors of the group. The accompanying key will facilitate identification of the species of *Berosus* known to occur in Arizona.

Examination of museum material and the literature suggests that western species of this genus are greatly in need of study. This is especially true of the *Berosus peregrinus* complex. Specimens I collected at Peña Blanca, Arizona compare favorably with *B. peregrinus* from New York. Young (1954) gives the western limit of the range as Louisiana, however. Leech (1948) states that Arizona specimens of *B. peregrinus* may be the Mexican *B. sharpi* Zaitzev. Nevertheless, since the latter has not been reported from the United States and since it is not known well enough to be satisfactorily separated from *B. peregrinus*, no attempt has been made to include it in the key.

Berosus notapeltatus Van Tassell, NEW SPECIES

FIGS. 4-6

The large, shield-shaped or rectangular ante-median sutural black spot on the elytra and the narrow lateral yellow margins of the pronotum readily separate this species from *Berosus moerens* Sharp (Fig. 1) and *Berosus blechrus* Leech (Fig. 7), both of which it closely resembles.

HOLOTYPE.—ARIZONA, Santa Cruz Co., Peña Blanca. Ross H. Arnett, Jr., and Eileen R. Van Tassell, August 2, 1962. To be deposited in U. S. National Museum.

¹ Department of Biology, The Catholic University of America, Washington 17, D.C., Entomology Series, paper no. 18.

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DESCRIPTION OF THE HOLOTYPE.—Male. Length 3.4 mm.; width 1.5 mm.

Head: Length/width ratio, .642; black with metallic rubescent to virescent luster; coarsely punctate basally, more finely and densely punctate distally, interspaces a little less than width of punctures basally, punctures barely separated distally; glabrous except for a series of fine hairs arising from punctures of labrum. Antennal club densely pubescent. Eyes large, one-half length of head, protuberant. Maxillary palpi slender, subequal in length to antennae; rufo-testaceous, apical third of distal segment piceous to brunneus. Mandibles stout, strongly curved, with two dorso-lateral teeth and two mandibulites. The latter are the "lacinia mobilis" of Hansen (1930), but following Snodgrass (1950), they are not regarded here as homologs of the lacinia, hence the name mandibulites.

Pronotum: Length/width ratio, .666; metallic black, as on head, with a narrow ochraceous border extending from outer third of anterior margin laterally and posteriorly to just beyond posterior angles; convex, slightly wider anteriorly, but appearing narrower in dorsal view because of greater downward flexure of the anterior angles; punctation sparser than base of head medially, more dense laterally and basally with a few patches of very closely set punctures; anterior angles finely crenate to about middle of lateral margin.

Elytra: Length/width ratio, .666; relatively narrow, broadest just beyond middle; yellowish to ochraceous with the following piceous markings: a humeral spot with a narrow anterior bar joining a sutural stripe; a large ante-median sutural spot, about as long or longer than distance between it and anterior margin of elytra and about one-half width of elytra in dorsal view, reaching third stria; a smaller postmedian sutural spot, barely separated from sutural stripe; a broad piceous to rufo-piceous lateral band of indefinite boundaries extending about four-fifths of length of elytra from just behind humeral spot; a small spot beneath each strial puncture, the spots joining on most of the striae to give a striped appearance; punctures of interspaces light brown or undifferentiated in color. Striae impressed except on disc, second stria short; strial punctation similar in size to that of pronotum, becoming coarser apically; punctures of interspaces each bearing a fine, silky hair; humeral angles crenate.

Legs slender; brown, streaked or tinged with piceous; trochanters, apices of femora and tibiae ochraceous to rufo-testaceous, protibia entirely rufo-testaceous; profemora finely granular in basal third ventrally, meso- and metafemora granular in basal two thirds ventrally, entirely glabrous on dorsal surface. Basal segment of protarsus slightly dilated with a dense ventral pad of hairs on distal half; first segment twice as long as second, second segment also bearing a ventral pad of hairs on distal half.

Sternum finely and evenly granulose; piceous to rufo-piceous; mesosternal protuberance granulose, thin, but not blade-like as in *Berosus infuscatus*, with a low anterior tooth; abdominal pubescence fine, silvery; first visible abdominal sternite with a median longitudinal carina just reaching posterior margin, fifth sternite with two small, closely set teeth in median emargination.

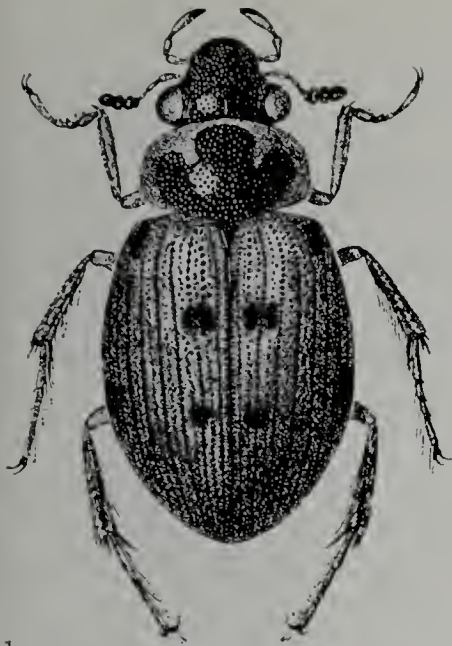
Aedeagus: Penis slender, slightly sinuate, pointed at apex; distal half of parameres bluntly, unevenly triangular in lateral view, partly membranous, dorsal margin moderately curved; pars basalis large, rectangular, distal edge articulating with apical third of ventral side of parameres (Fig. 5).

ALLOTYPE:—Same locality data as holotype. Female. Length 3.7 mm.; width 1.6 mm. Similar to male, but with striae less impressed, giving more of a ridged appearance, basal segment of protarsus not dilated, alutaceous, lateral piceous markings reduced to a single median lateral spot.

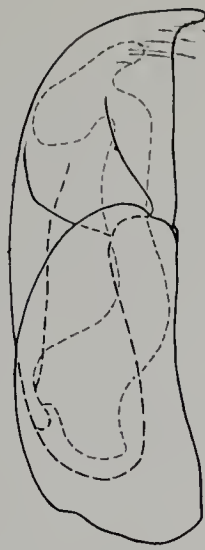
PARATYPES:—222; 96 males, 86 females from ARIZONA, Santa Cruz Co., Peña Blanca; 25 males and 15 females from Santa Cruz Co., Sycamore Canyon, Yanks Springs, Hugh B. Leech, August 3, 1952.

LARVAE: Unknown.

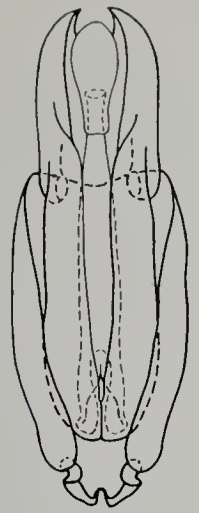
DISTRIBUTION: Known only from Arizona, Peña Blanca and Yanks Springs.



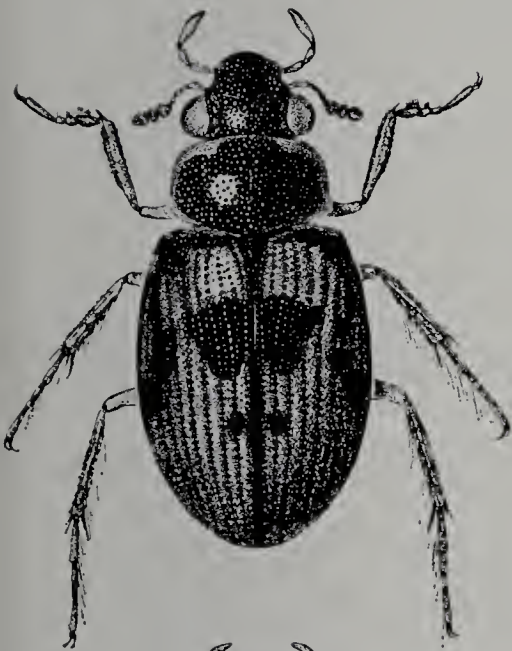
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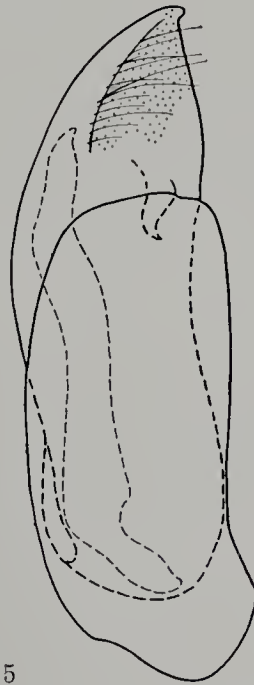
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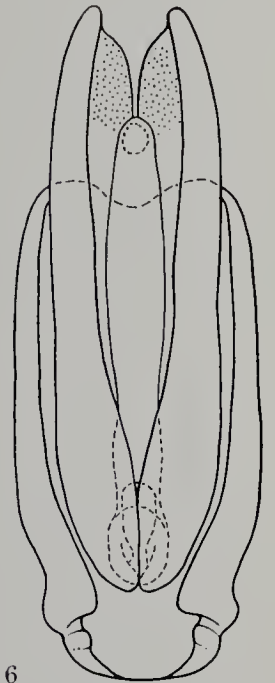
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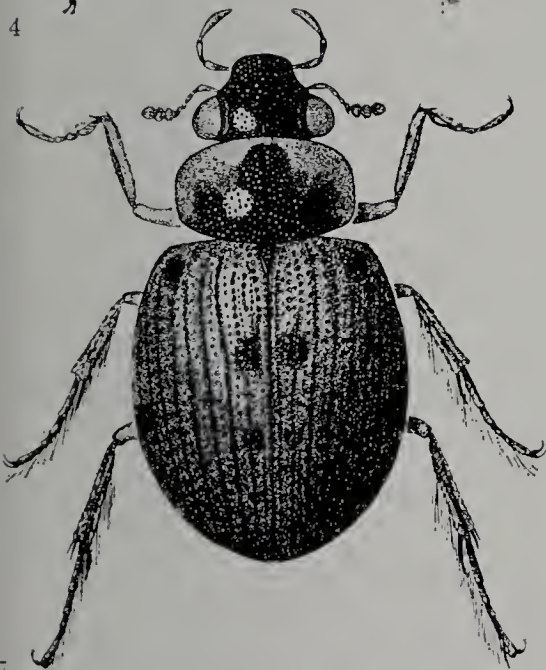
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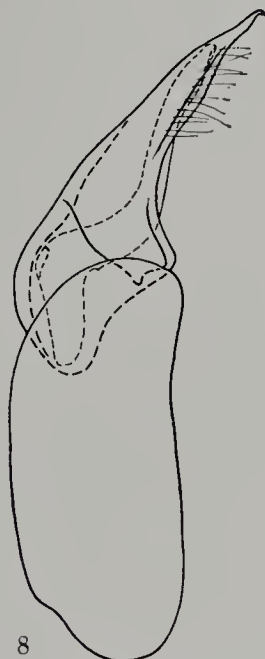
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FIGURES 1-3, *Berosus moerens* Sharp. 1—adult male. 2—aeedeagus, lateral view. 3—aeedeagus, dorsal view.

FIGURES 4-6, *Berosus notapeltatus*, new species. 4—holotype male. 5—aeedeagus, lateral view. 6—aeedeagus, dorsal view.

FIGURES 7-9, *Berosus blechrus* Leech. 7—adult male. 8—aeedeagus, lateral view. 9—aeedeagus, dorsal view.

All drawings were made from specimens collected at Pena Blanca, Arizona.

VARIATION: Length 3.0-3.8 mm. The elytra vary from pale ochraceous to deep yellow brown. In the palest specimens, the dark markings on the elytra are a pale chocolate brown and the lateral dark band is absent or reduced to a single median lateral spot. A single specimen from Yanks Springs had all elytral markings, including the large ante-median spot, reduced nearly to the size of the spots of *B. moerens* (Fig. 1). The darkest individuals have the humeral spot merged with the broad lateral band, which in turn is nearly continuous with the large ante-median bar. In general, the females show greater reduction of the lateral markings than the males. The yellow markings of the pronotum vary from a barely discernible lateral margin to a margin nearly approaching that of *B. moerens* in width, but never deeply incising the piceous spot to give a tri-lobed appearance as is the case with *B. moerens*.

BIOLOGY: This small species may be found in a variety of situations from stagnant rain puddles to margins of streams or arroyos. Most specimens may be found in livestock watering tanks and troughs during the dry season, since other aquatic situations are not available in this area during most of the year. Adults were collected as early as June 30 and as late as August 12.

A KEY TO THE ARIZONA SPECIES OF BEROSUS (HYDROPHILIDAE)

- | | | |
|----|--|------------------------|
| 1. | Elytral apices with one or two spines----- | 2 |
| | Elytral apices without spines----- | 4 |
| 2. | Pronotum smooth, fairly coarsely but more sparsely punctate, median carina hardly differentiated; each elytron with a tooth before the sutural angle, the latter produced into a tooth; elytral interspaces smooth, shining (males) or finely alutaceous (females), the punctures separated by about twice their own diameters; Texas, Arizona, Baja California----- | MILES LeConte |
| | Pronotum coarsely, deeply punctate, with a longitudinal carina at middle; each elytron with a tooth before the sutural angle, the angle itself acute and slightly produced (most males) or rectangular or obtuse (most females); elytral interspaces rough, with numerous punctures, the margins of which are scabrous----- | 3 |
| 3. | Metasternum with apical median process broad, triangular, tooth-like, obscurely carinate along middle; form narrower (length 7 mm., width 3 mm.); parameres of male genitalia somewhat constricted in apical fifth, gradually narrowed to apices, which though spinous are shorter; Mexico, Arizona----- | SALVINI Sharp |
| | Metasternum with apical median process narrower, with a sharp, blade-like, raised carina; form broader (length 7 mm., width 3.75-4 mm.); parameres of male genitalia gradually narrowed to apices, which are not spinous; Arizona, California, Nevada, Washington----- | PUNCTATISSIMUS LeConte |
| 4. | Last visible abdominal sternite with two small teeth in apical emargination----- | 5 |
| | Last visible abdominal sternite with one tooth in apical emargination----- | 11 |
| 5. | Mesosternal protuberance with crest low or hoodlike, but not falcate----- | 6 |
| | Mesosternal protuberance with crest falcate anteriorly; Ohio to California, Mexico----- | STYLIFER Horn |
| 6. | Mesosternal protuberance with crest excavated, hood-like; Southern California, Baja California, Arizona, Mexico----- | RUGULOSUS Horn |
| | Mesosternal protuberance with crest not hoodlike----- | 7 |
| 7. | Pronotum mainly testaceous with a central dark spot or pair of spots; size 4-6 mm.-- | 8 |
| | Pronotum mainly metallic black or with a large irregular or trilobed black or metallic black spot; size smaller, 3.0-3.8 mm.----- | 9 |

8. Elytra and pronotum of female and pronotum of male distinctly micro-reticulate (alutaceous), not strongly shining; elytral striae not very deeply impressed on the disc; middle and southern United States ----- **INFUSCATUS** LeConte
Elytra and pronotum of male and elytra of female without evident micro-reticulation, appearing very smooth and shining between the coarser punctures; elytral striae rather deeply impressed, especially on the disc; northern and western United States, southern Canada ----- **FRATERNUS** LeConte
9. Strial intervals of elytra with punctures dark brown to piceous, conspicuous; form broader; lateral yellow margins of pronotum broad ----- 10
Strial intervals of elytra with punctures usually inconspicuous, not darkly colored; form narrower; pronotum with lateral yellow margins narrow or absent (Fig. 4); Arizona ----- **NOTAPELTATUS** n. sp.
10. Pronotum more convex, especially anteriorly; parameres of male genitalia strongly curved in profile, sharply pointed, but not acuminate (Fig. 2); Arizona, Texas, California, Mexico, Guatemala ----- **MOERENS** Sharp
Pronotum flatter, less densely punctate; parameres of male genitalia acuminate, only slightly curved in profile (Fig. 8); Arizona, Texas ----- **BLECHRUS** Leech
11. Pronotal punctation of two sizes, large and small punctures intermixed; Arizona -
----- **EXILIS** LeConte
Pronotal punctures of nearly uniform size; New York to Florida and Louisiana, Arizona ----- **PEREGRINUS** (Herbst)

Relative abundance of three species: *Berosus blechrus* is apparently rare at Peña Blanca, only ten specimens have been collected by the author during three summers; *B. moerens* and *B. notapeltatus* were present abundantly in about equal numbers. In a single collection at Yanks Springs, however, the situation seems to be reversed (Leech, *in litt.*), with *B. blechrus* (67 specimens) and *B. notapeltatus* (40 specimens) abundant and *B. moerens* (8 specimens) uncommon. Peña Blanca and Yanks Springs are the only localities where all three species have been found together. The data indicate that where *B. moerens* is abundant, *B. blechrus* is rare and where *B. moerens* is rare, *B. blechrus* is abundant. Further study of the life-history and biology of these two species may indicate that they are in competition.

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How often is it actually defensible to state, without fossil evidence, what is "primitive" and what "derivative"?—Lindroth, 1962, Psyche 69:10.